



IDAHO DEPARTMENT
OF HEALTH AND WELFARE

DIVISION OF
ENVIRONMENTAL QUALITY

Explanation of Significant Differences

Explanation of Significant Differences for the Record of Decision for the Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites

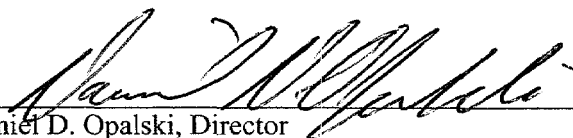
At the Idaho Cleanup Project
Idaho National Laboratory Site
Idaho Falls, Idaho

**Explanation of Significant Differences for the Record
of Decision for the Experimental Breeder
Reactor-I/Boiling Water Reactor Experiment Area and
Miscellaneous Sites**

March 2006

**Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office**

Signature sheet for the *Explanation of Significant Differences for the Record of Decision for the Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites* at the Idaho National Laboratory Site, between the U.S. Department of Energy and the U.S. Environmental Protection Agency, with concurrence by the Idaho Department of Environmental Quality.

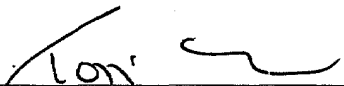


Daniel D. Opalski, Director
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U.S. Environmental Protection Agency

3-24-06

Date

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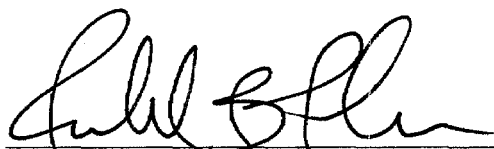


Toni Hardesty, Director
Idaho Department of Environmental Quality

3/1/06

Date

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Richard B. Provencher, Deputy Manager
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3/23/06

Date

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	<i>Code of Federal Regulations</i>
DOE-ID	U.S. Department of Energy Idaho Operations Office
ESD	explanation of significant differences
INL	Idaho National Laboratory
MISC	miscellaneous
OU	operable unit
RCRA	Resource Conservation and Recovery Act
RDX	Royal Demolition Explosive
ROD	Record of Decision
STF	Security Training Facility
TNT	trinitrotoluene
USC	<i>United States Code</i>
UXO	unexploded ordnance
WAG	waste area group

Explanation of Significant Differences for the Record of Decision for the Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites

1. INTRODUCTION

This Explanation of Significant Differences (ESD) report incorporates two contaminated sites into the *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites* (DOE-ID 2002a), which is the Record of Decision (ROD) for Operable Unit (OU) 10-04 at the Idaho National Laboratory (INL) Site. The OU 10-04 ROD was signed in November 2002 by the U.S. Department of Energy, the U.S. Environmental Protection Agency Region 10, and the Idaho Department of Environmental Quality (a.k.a., the Agencies) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.).

The two sites are designated as Miscellaneous (MISC) -026 and MISC-035. MISC-026 consists of a detonation pit between the Naval Reactors Facility and the Reactor Technology Complex. MISC-035 comprises detonation pits located north of the former Experimental Organic-Cooled Reactor Complex.

After the OU 10-04 ROD (DOE-ID 2002a) was signed, the two sites were identified for possible remediation of soil contaminated with trinitrotoluene (TNT) and Royal Demolition Explosive (RDX). As such, the sites were listed for inclusion in OU 10-08. Later, however, the Agencies recommended that an ESD be written to include the two sites in the OU 10-04 ROD, because it addresses other sites with contamination similar to that found at MISC-026 and MISC-035.

This ESD was prepared in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(i) of the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300). This ESD documents significant changes to portions of the remedies selected in the OU 10-04 ROD (DOE-ID 2002a).

The lead agency for this remedial action is the U.S. Department of Energy Idaho Operations Office (DOE-ID). The U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality agree on the need for this significant change to the selected remedy in the OU 10-04 ROD (DOE-ID 2002a). The three agencies participated jointly in the review of new information and the decision that led to preparation of this ESD.

This ESD will become part of the INL Site administrative record for OU 10-04. The INL Site administrative record is part of the INL Site’s information repositories, which are available on the Internet at <http://ar.inel.gov/home.html> and at the following locations:

INL Technical Library
U.S. Department of Energy Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415
(208) 526-1185
Hours: 8 a.m. to 5 p.m. Monday through Friday, except as posted.

Albertsons Library
Boise State University
1910 University Drive
Boise, ID 83725
(208) 385-1621

Hours: 7:30 a.m. to 12 midnight Monday through Thursday; 7:30 a.m. to 8 p.m. Friday; 10 a.m. to 8 p.m. Saturday; 10 a.m. to midnight Sunday, except as posted.

2. SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

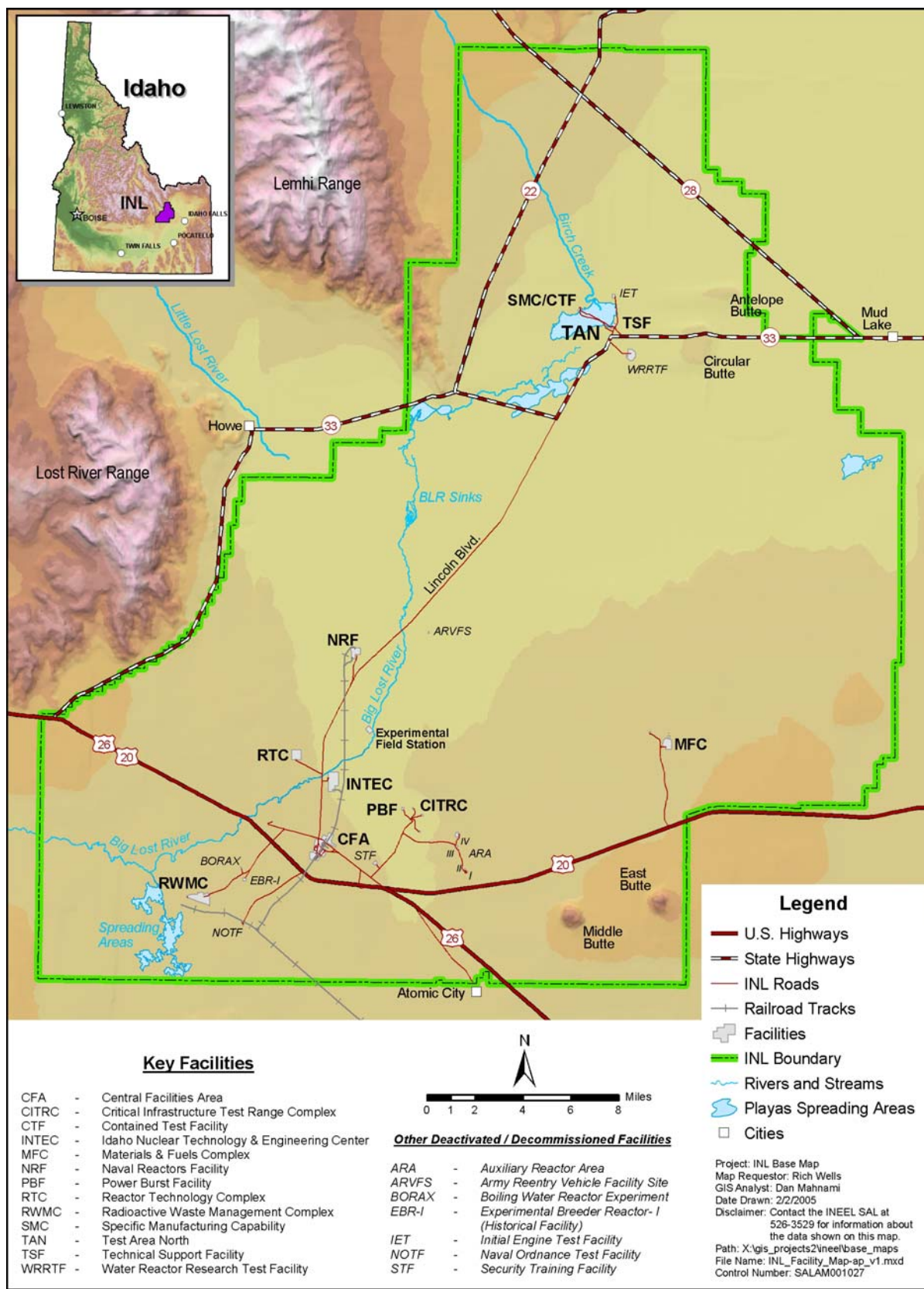
This section briefly discusses the history of the INL Site, the soil sites, the nature and extent of contamination, and the various selected remedies.

2.1 Site History

The INL Site is an 890-mi² federal facility managed by the U.S. Department of Energy and is located 32 mi west of Idaho Falls, Idaho, on the northeastern edge of the Eastern Snake River Plain (Figure 1). The INL Site was established in 1949 by the U.S. Atomic Energy Commission as the National Reactor Testing Station. Its purpose was to conduct nuclear energy research and related activities. It was redesignated the Idaho National Engineering Laboratory in 1974 and then the Idaho National Engineering and Environmental Laboratory in 1997 to reflect the expansion of its mission to include a broader range of engineering and environmental management activities. In mid-2003, the laboratory was restructured into two separate business units: (1) INL for laboratory research and development missions and (2) the Idaho Cleanup Project for cleanup activities. In February 2005, the two business units also came under the management of two separate contractors, and the name of the laboratory was changed to the Idaho National Laboratory in keeping with its multiple uses. This separation allows each organization to focus on its distinct mission: (1) major mission realignment of the INL as the lead laboratory for nuclear energy research and (2) the Idaho Cleanup Project mission to focus on environmental remediation and clean up of historical contamination at the INL Site as quickly and efficiently as possible (Litus and Shea 2005).

Operable Unit 10-04 comprises the miscellaneous sites at the INL Site, including Waste Area Group (WAG) 6, as well as surface contamination sites in WAG 10. The *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10, Operable Unit 10-04* (DOE-ID 2001) evaluated 50 potential release sites, including 22 sites at WAG 6 and 28 sites at WAG 10. The WAG 10 sites include three large (primary) ordnance areas (one of which contains 16 smaller ordnance areas) and nine ordnance areas either outside the boundaries of the larger ordnance areas or possessing soil contamination. The three primary ordnance areas include the Naval Proving Ground, the Arco High Altitude Bombing Range, and the Twin Buttes Bombing Range.

Most ordnance, unexploded ordnance (UXO), and UXO-related areas at the INL Site result from activities conducted at the Naval Proving Ground in the 1940s. Between 1942 and 1950, approximately 1,650 minor (3- to 5-in.) and major (16-in.) guns were tested at the Naval Proving Ground. Most of the projectiles were nonexplosive. However, experimental and test work also was performed using explosives and live ordnance, primarily in mass detonations. During these large-scale mass detonation tests, hundreds of thousands of pounds of explosives in land mines, smokeless powder, and bombs were placed in explosives' storage bunkers or open areas and detonated to determine the effects on collocated bunkers and facilities. In addition, stacks of ammunition were shot with high-explosive projectiles to test their susceptibility to enemy fire. As a result of activities at the Naval Proving Ground, many projectiles (explosive and inert), explosive materials, pieces of explosives, UXO, Naval Proving Ground structures,



and debris remain. At locations where these materials remain from explosive testing activities (such as at the Naval Ordnance Disposal Area), UXO is clearly visible and has undergone limited remediation. In other locations where UXO remains from firing activities, projectiles have become imbedded in the ground; therefore, the UXO is not nearly as visible.

2.2 Selected Remedy

For sites contaminated with explosives (i.e., TNT and RDX), the selected remedial action as stipulated in the OU 10-04 ROD (DOE-ID 2002a) is removal, treatment of TNT/RDX fragments, disposal of soil, and institutional controls, and the remedial action will include the following activities:

- Perform a visual survey for UXO and TNT/RDX fragments or stained soil and a geophysical survey for UXO.
- Excavate soil contaminated with concentrations in excess of the remediation goals, by hand, unless it is determined that mechanical excavation equipment may be safely used. The UXO will be removed, if required, to proceed with soil excavation. Otherwise, UXO removal will be performed during remediation of the ordnance areas.
- Manually segregate fragments of TNT/RDX from the soil unless the safety analysis indicates that it is safe to mechanically screen the soil.
- Dispose of fragments of TNT/RDX by detonation at the Mass Detonation Area. Waste generated during detonation activities will be addressed using current disposal practices.
- Use field-screening methods and soil sampling with laboratory analysis to determine the extent of soil removal required to meet the remediation goals.
- Sample and analyze removed soil by standard laboratory methods to determine the TNT and RDX concentrations and if the soil exhibits any Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics (42 USC § 6901 et seq.). If the TNT/RDX concentration is less than 10% and not regulated under RCRA as characteristic waste, it will be sent to an approved disposal facility on or off the INL. If the concentration of TNT/RDX is above 10% and, hence, regulated under RCRA, the soil will be sent off the INL to an approved treatment, storage, and disposal facility for thermal treatment and disposal.
- Backfill areas that have been excavated during remediation to depths greater than 0.3 m (1 ft) with uncontaminated soil or contoured to match the surrounding terrain and vegetate.
- Monitor air and soil until the TNT/RDX contamination is removed or reduced to acceptable levels.

3. DESCRIPTION OF SIGNIFICANT DIFFERENCE AND THE BASIS FOR THE DIFFERENCE

3.1 New Sites

Sites MISC-026 and MISC-035 were identified after the OU 10-04 ROD was signed (DOE-ID 2002a). As such, the sites were assigned to OU 10-08. During a review of the information presented in the *Site 026 Track 1 Decision Documentation Package, OU 10-08* (DOE-ID 2002b) and the *Site 035 Decision Documentation Package, OU 10-08* (DOE-ID 2002c), it was determined that the explosives contamination at these two sites is similar to that found at other TNT- and RDX-contaminated sites addressed in the OU 10-04 ROD (DOE-ID 2002a). Consequently, the determination presented in the Track 1 documentation for the two sites recommended their inclusion under OU 10-04, thereby requiring preparation of an ESD to incorporate them into the existing ROD. Figures 2 through 4 provide photographic evidence of the type and approximate extent of contamination at MISC-026, and Figures 5 and 6 show MISC-035.



Figure 2. MISC-026 detonation pit between the Naval Reactors Facility and the Reactor Technology Complex.



Figure 3. Trinitrotoluene fragments at MISC-026.



Figure 4. Additional evidence of trinitrotoluene at MISC-026.



Figure 5. Detonation pit at MISC-035.



Figure 6. Additional detonation pit at MISC-035.

3.1.1 Site MISC-026

Site MISC-026 consists of a detonation pit located adjacent to the T-3 dirt road, midway between the Naval Reactors Facility and the Reactor Technology Complex, just north of Lincoln Boulevard (Figure 7) and encompasses a small area of approximately 764 ft². Disturbed vegetation and stained soil are evident, and numerous metal fragments are scattered about the pit and surrounding area. MISC-026 is located within the naval firing fan, an area of the INL Site that was set aside by the U.S. Navy to test fire naval guns, conduct mass detonation tests, practice aerial bombing, and conduct explosive material compatibility tests during World War II. MISC-026 was investigated as part of an INL Site ordnance removal action in 1999. The site was surveyed, and no visual evidence of UXO was found. Rusted metal fragments found in the area were reported as most likely the remnants of land mines or projectiles, inert substances that pose no risk to human health or the environment. The source and extent of contamination cannot be determined with existing information but may be attributed to TNT, as evidenced by the presence of stained reddish-brown soil. The *Site 026 Track 1 Decision Documentation Package, OU 10-08* (DOE-ID 2002b) recommended that the site be transferred to OU 10-04, which encompasses explosive-contaminated and UXO-contaminated sites.

3.1.2 Site MISC-035

Site MISC-035 consists of three earthen detonation pits located approximately 600 ft north of the Security Training Facility (STF) -02 gun range berm (Figure 8). The STF-02 gun range was used from 1983 to 1990 for security-force practice maneuvers using small-caliber weapons. The pits are 12 to 18 ft in diameter and 1 to 3 ft deep within an area of approximately 3,660 ft². They contain scattered debris, including weathered wood, small metal fragments, glass, plastic, foam insulation, wire, hose pieces, M-60 blanks, and a spent tear gas bomb. Site MISC-035 lies east/southeast of CFA-633, which was the origin of the naval firing fan that points toward the north/northeast from that location. The site lies within the boundary of the Naval Proving Ground at the INL. The pits might have resulted from a test in the 1980s of the consolidation of rapidly solidified powders using TNT, C-4, and other high explosives. The site investigation revealed that although visual evidence of disturbed soil and vegetation exists, there is no evidence of explosive residuals. The vegetation in the center of the pits and surrounding area appears healthy and well established. The potential exists that the pits resulted from STF personnel activities, including the destruction of vehicles, thus accounting for the metal fragments scattered throughout the area. Although no visual evidence of stained soil or unusual odors exists, the vegetation and soil have been disturbed. The *Site 035 Decision Documentation Package, OU 10-08* (DOE-ID 2002c) recommended that the site be transferred to OU 10-04, which addresses other explosive-contaminated and UXO-contaminated sites.

3.2 Overall Protection of Human Health and the Environment

Incorporating MISC-026 and MISC-035 into OU 10-04 and addressing the contamination under the requirements delineated in the OU 10-04 ROD (DOE-ID 2002a) protect human health and the environment, in both the short and long term, from unacceptable risks posed by hazardous substances. This is accomplished by eliminating or reducing exposure to levels within the remediation goals specified in the OU 10-04 ROD. The primary risk associated with the two sites is that presented by explosive fragments and soils potentially contaminated by the explosives. Explosive fragments will be removed either under the requirements specified in the *Operations and Maintenance Plan for the Operable Units 6-05 and 10-04, Phase I* (DOE-ID 2004a), which provides for the removal and disposal of explosives that pose an imminent hazard to human health or the environment, or the requirements outlined in the *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II* (DOE-ID 2004b). Contaminated soils at the sites will be addressed under the *Remedial Design/Remedial*

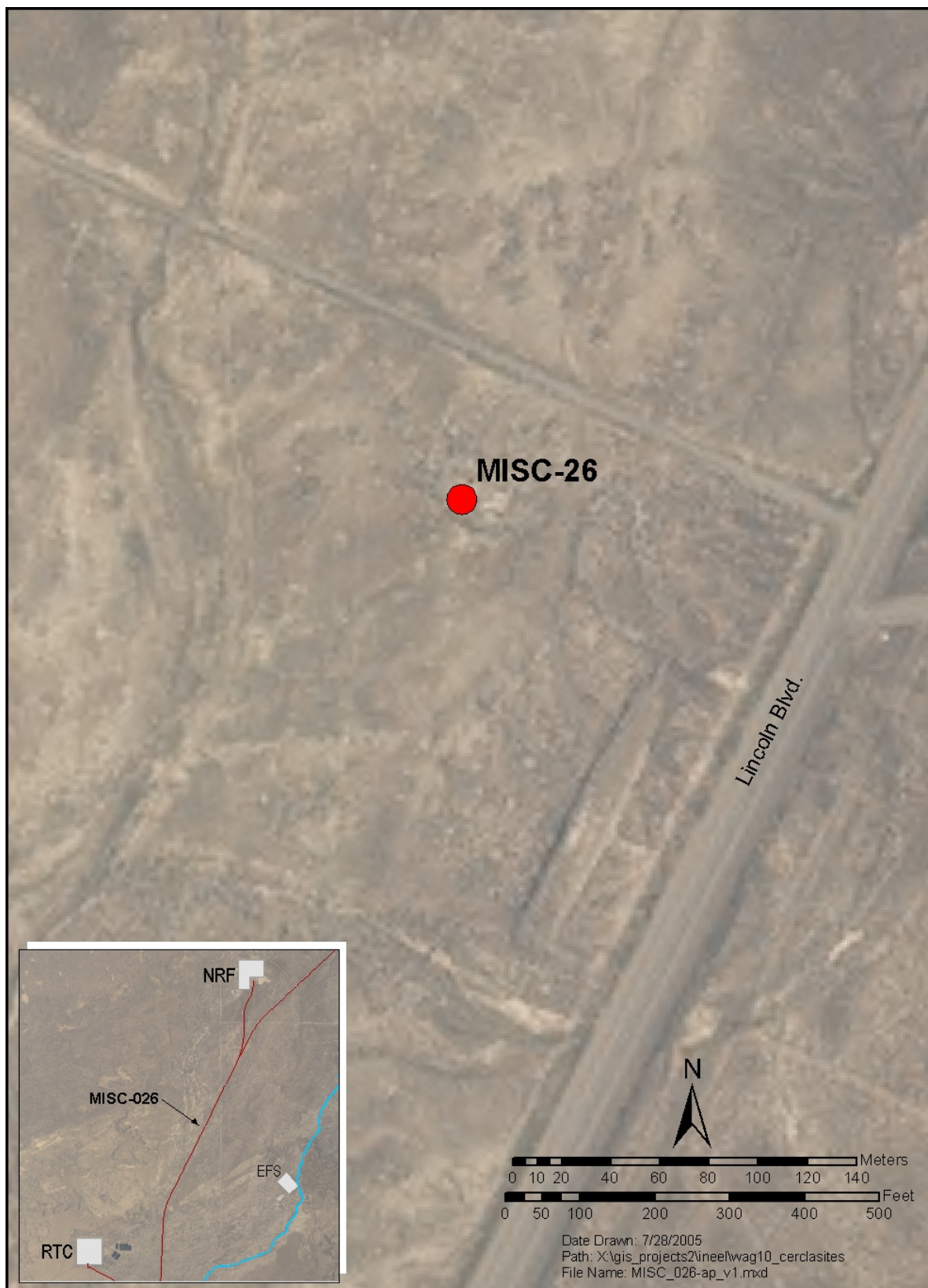


Figure 7. MISC-026 detonation pit between the Naval Reactors Facility and the Reactor Technology Complex.



Figure 8. Detonation pits north of the Experimental Organic-Cooled Reactor.

Action Work Plan for Operable Units 6-05 and 10-04, Phase II (DOE-ID 2004b). A revision to the Remedial Design/Remedial Action Work Plan and associated documentation will be prepared to incorporate the two sites.

The *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II* (DOE-ID 2004b) addresses the remediation of TNT- and RDX-contaminated soil sites at the INL. The remedial activities will include:

- Establishing and maintaining institutional controls (as required) until the contamination is removed or reduced to acceptable levels
- Performing a visual survey to identify any UXO and TNT/RDX fragments and stained soil coupled with a geophysical survey for UXO
- Excavating contaminated soil
- Segregating and disposing of TNT/RDX fragments at the Mass Detonation Area
- Performing sampling and analysis of soil to determine excavation requirements and when the remediation goals have been met
- Backfilling and contouring excavated areas
- Revegetating affected areas
- Monitoring air and soil during the remedial action.

These activities will be performed in accordance with the requirements delineated in the OU 10-04 ROD (DOE-ID 2002a) as defined in Section 2.2 of this ESD.

3.3 Compliance with Applicable or Relevant and Appropriate Requirements

Incorporating MISC-026 and MISC-035 into the OU 10-04 ROD (DOE-ID 2002a) and addressing the contamination under the requirements presented therein ensure that the applicable or relevant and appropriate requirements promulgated in the OU 10-04 ROD are met in compliance with federal and state environmental laws. As provided in the OU 10-04 ROD, the substantive applicable or relevant and appropriate requirements in the Resource Conservation and Recovery Act (42 USC § 6901 et seq.) and the Idaho Administrative Procedures Act will be met.

3.4 Cost

Incorporation of Sites MISC-026 and MISC-035 into the OU 10-04 ROD (DOE-ID 2002a) and remediation of contaminated soil at the two sites is anticipated to result in an increase in the total estimated cost for the Phase II remedial activities of \$51.8K. The majority of the identified cost increase is related to revision of the Remedial Design/Remedial Action Work Plan documentation and work controls to incorporate the two sites.

4. PUBLIC PARTICIPATION ACTIVITIES

This ESD will become part of the administrative record for WAG 10 OU 10-04. A notice of availability and a description of this ESD will be published in the *Post Register* (Idaho Falls), *Idaho State Journal* (Pocatello), *Sho-Ban News* (Fort Hall), *Times News* (Twin Falls), *Idaho Statesman* (Boise), and *Daily News* (Moscow). As modified from the original ROD, this action does not represent a fundamental change in scope or purpose; therefore, a formal comment period will not be implemented. For additional information regarding this ESD, contact the INL Community Relations Office at (208) 526-4700 or 1-800-708-2680.

5. AFFIRMATION OF THE STATUTORY DETERMINATIONS

The U.S. Department of Energy, U.S. Environmental Protection Agency, and Idaho Department of Environmental Quality believe after reviewing the proposed changes to the selected remedy that the remedy remains protective of human health and the environment, complies with federal and state requirements identified in the OU 10-04 ROD (DOE-ID 2002a) as applicable or relevant and appropriate to the remedial action at the time of the final ROD, and is cost-effective.

6. REFERENCES

40 CFR 300, 2006, “National Oil and Hazardous Substances Pollution Contingency Plan,” Code of Federal Regulations, Office of Federal Register, January 2006.

42 USC § 6901 et seq., 1976, “Resource Conservation and Recovery Act (Solid Waste Disposal Act),” United States Code, October 21, 1976.

42 USC § 9601 et seq., 1980, “Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund),” United States Code, December 11, 1980.

DOE-ID, 2001, *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04*, DOE/ID-10807, Rev. 0, U.S. Department of Energy Idaho Operations Office, August 2001.

DOE-ID, 2002a, *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites*, DOE/ID-10980, Rev. 0, U.S. Department of Energy Idaho Operations Office, November 2002.

DOE-ID, 2002b, *Site 026 Track 1 Decision Documentation Package, OU 10-08*, DOE/ID-10895, Rev. 0, U.S. Department of Energy Idaho Operations Office, April 2002.

DOE-ID, 2002c, *Site 035 Decision Documentation Package, OU 10-08*, DOE/ID-10901, Rev. 0, U.S. Department of Energy Idaho Operations Office, April 2002.

DOE-ID, 2004a, *Operations and Maintenance Plan for Operable Units 6-05 and 10-04, Phase I*, DOE/ID-11102, Rev. 1, U.S. Department of Energy Idaho Operations Office, February 2004.

DOE-ID, 2004b, *Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II*, DOE/NE-ID-11127, Rev. 0, U.S. Department of Energy Idaho Operations Office, August 2004.

Litus, Marty and Jerry P. Shea, 2005, *Summary of Cleanup at the Idaho National Laboratory Site*, ICP/EXT-05-00806, Rev. 0, Idaho National Laboratory, Idaho Cleanup Project, March 2005.